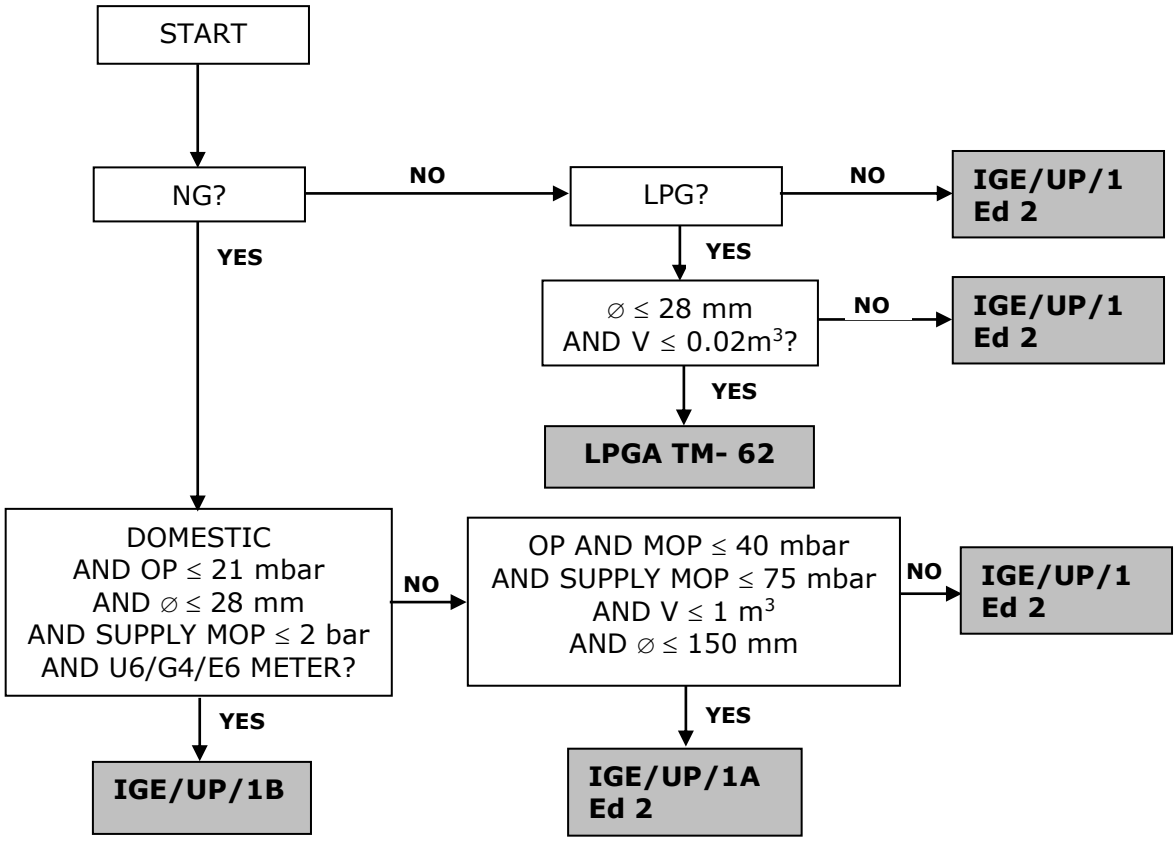
IGE/UP/1 EDITION 2
COMMUNICATION 1683
2003

The following Amendments (March 2005) apply to all copies of IGE/UP/1 Edition 2 published in 2003 and supersede the Amendment of August 2004. It is not necessary to apply these to IGE/UP/1 Edition 2 Reprint with Amendments (Communication 1716) which already includes them.

Figure 2. **Delete flow diagram entirely retaining the italicised key and title. Substitute:**



Sub-Section 2.2 **Add a further Note after Note 2:**
Note 3: See Sub-Section 2.7 regarding the principles adopted for the detection of leakage.

Section 2 **Add:**

2.7 IGE/UP/1 Edition 2 adopts the concept of "gauge readable movement (GRM)". When using a water gauge, it may be possible to reduce the duration of tests for new installations and extensions by adopting the concept of "no perceptible movement". This will lower test times in many cases but has to be subject to a thorough analysis, by the responsible person, of the complex fluid mechanics and mathematics involved.

Section 3 **Add:**

3.4 In the following situations, electronic equipment shall be certified for use in a hazardous area:

- when seeking the source of a known or suspected gas leak, using a gas detector
- when a hazardous area is imposed by another installation, for example an oil supply, and the equipment is to be used within that area
- when a risk assessment indicates that use of uncertified equipment is not acceptable (see below)

- when it is anticipated that the area in which the equipment will be located will be left unattended at any time during the test/purge.

The decision on whether electronic equipment, for example pressure gauges and gas detectors, can be of a type not certified for use in a hazardous area, may be complex and is not an issue that can be developed in IGE/UP/1. However, unless the pipework being tested or purged is known to contain only air and/or inert gases (in which case equipment that is not certified may be used) any use of such uncertified equipment shall be subject to a suitable risk assessment prior to use. Equipment manufacturers' instructions may assist in this risk assessment.

Note 1: For lower pressures, water gauges can always be used if there is any doubt about the use of uncertified gauges.

Note 2: For MOP ≤ 75 mbar, use of uncertified gauges placed in the open air and located at least 150 mm from any potential gas source (a greater clearance may be required) may be acceptable although it is still possible for a hazardous area to apply, particularly as imposed by another installation.

Note 3: Further guidance on hazardous area classification is available in IGE/GM/7 Edition 2 and IGE/G/3 (publication anticipated in 2005) and is contained in BS EN 60079.

Page 10 **Delete entirely. Substitute attached new page 10 (UP/1/3).**

Clause 4.2.1 **Delete clause and associated note entirely. Substitute:**

A strength test shall be carried out on any new installation or extension except for components that have been pre-tested or have been removed to avoid over pressurisation, for example appliances.

Note: Where a component or sub-assembly (meter installation component, meter "skid" unit, etc.) has been pre-tested and not subsequently modified and has appropriate certificates of conformity available, the strength testing of such a component/assembly need not be undertaken but a visual examination of joints, general condition, suitability, etc. is recommended prior to installing and subsequent tightness testing as for a new installation (see Sub-Section 4.4). Permanent marking, for example by manufacturer's badging/stamping, may be deemed as certification of conformity.

Table 1. **Delete entirely retaining the italicized text and title. Substitute:**

MOP	Ø (mm)	TEST METHOD	STP (greater of)	STABILIZE (mins)	STD (mins)	Maximum drop % STP	
METALLIC PIPEWORK						**Pneu.**	**Hydro.**
≤ 100 mbar	ALL	Pneumatic or hydrostatic *[1]	1.1 MIP and 2.5 MOP[*3]	5	5	20	5
>100 mbar ≤ 1 bar	ALL	Pneumatic or hydrostatic*[1]	1.1 MIP and 2.0 MOP[*3]	10	5	20	5
>1 bar ≤ 2 bar	ALL	Pneumatic or hydrostatic	1.1 MIP and 1.5 MOP	10	5	20	5
>2 bar ≤ 16 bar	≤ 25	Pneumatic or hydrostatic*[1]	1.1 MIP and 1.5 MOP[*3]	15	30	20	5
>2 bar ≤ 7 bar	>25 ≤ 150	Pneumatic or hydrostatic*[1]	1.1 MIP and 1.5 MOP [*3]	30	30	20	5
>2 bar ≤ 7 bar	>150	Hydrostatic*[2]	1.1 MIP and 1.5 MOP	30	30	N/A	5
>7 bar ≤ 16 bar	>25	Hydrostatic*[2]	1.1 MIP and 1.5 MOP	30	30	N/A	5
PE PIPEWORK							
≤100 mbar	ALL	Pneumatic or hydrostatic*[1]	1.1 MIP and 2.5 MOP[*3]	5	5	20	5
>100 mbar ≤ 200 mbar	ALL	Pneumatic or hydrostatic*[1]	1.1 MIP and 1.75 MOP[*3]	10	15	20	5
>200 mbar ≤ 1 bar*[4]	ALL	Pneumatic or hydrostatic*[1]	1.1 MIP and 1.5 MOP[*3]	15	15	20	5
>1 bar ≤ 3 bar*[4]	ALL	Pneumatic or hydrostatic*[1]	1.1 MIP and 1.5 MOP and 3 bar[*3]	30	15	20	5
>3 bar ≤ 6 bar*[4]	ALL	Hydrostatic*[2]	1.1 MIP and 1.5 MOP and 6 bar	30	30	N/A	5
>6 bar ≤ 7 bar*[4]	ALL	Hydrostatic*[2]	1.1 MIP and 1.5 MOP and 7 bar	30	30	N/A	5
>7 bar ≤ 10 bar*[4]	ALL	Hydrostatic*[2]	1.1 MIP and 1.5 MOP	30	30	N/A	5

SECTION 4 : STRENGTH TESTING

New pipework, designed in accordance with current relevant standards, will have been designed to withstand the strength test pressure (STP). However, particular components within the pipework may need to be removed for the strength test (see Sub-Section 4.4). In addition, appliances may not be designed to withstand STP.

Strength testing is used to identify any major flaw in the construction of a new installation, prior to tightness testing.

A strength test permits a fall in pressure limited to the value given in Table 1.

It is possible to combine the strength and tightness tests. This may save a little time by not requiring a stabilization period for the tightness test. It can only be achieved if the strength test is a pneumatic test (but see Note 1 to Table 1). Appendix 3 provides guidance which should be followed if it is decided to combine the strength and tightness tests. The procedures outlined in Sections 4 and 5 assume a separate test for each and the principles equally apply for a combined test.

Some LDFs have an adverse effect on certain pipework materials. Consequently, any residual fluid shall be washed thoroughly off the pipe and subsequently dried.

If necessary, for example when joints are broken, temporary electrical continuity bonds shall be installed before testing.

Acronyms

ECV	=	emergency control valve	NDT	=	non-destructive testing
IV	=	installation volume	OP	=	operating pressure
GT	=	gas transporter	PE	=	polyethylene
LDF	=	leak detection fluid	PRI	=	pressure regulating installation
MAM	=	meter asset manager	SSOV	=	safety shut-off valve
MIP	=	maximum incidental pressure	STP	=	strength test pressure
MOP	=	maximum operating pressure	STD	=	strength test duration.

4.1 DETERMINATION OF MOP AND MIP

Strength test pressure (STP) is determined using either a multiple of MOP or MIP or, for PE at higher pressures, a fixed pressure, all as given in Table 1. The following assumes that strength testing is applied to new installation pipework or new extensions only. If an existing installation is to be strength tested (see clause 4.2.2), it may be more difficult to obtain the detail of MIP and MOP for installations not previously tested as new to this edition of IGE/UP/1.

These Procedures assume that MOP equates to Design Pressure (DP). Where DP is quoted and is in excess of MOP, then the value of DP shall be used in the calculation of STP.

4.1.1 Normally, the values of MIP and MOP shall be obtained from the designer of the installation pipework or, for a meter installation, from the MAM. For pipework installed between the ECV and the nearest downstream regulator, the values shall be obtained from the GT.

Note: While MOP will often equate to OP, the designer may have chosen to declare MOP at a higher value, in which case the calculation of STP has to take this higher value into account.

4.1.2 Where a booster or compressor is included anywhere downstream of, or within, the installation pipework being tested, the maximum back pressure shall be obtained from its owner. Where this pressure exceeds MIP, this back pressure shall be taken as MIP.

Clause 4.5.15 **2nd paragraph. Delete entirely. Substitute:**

STP and MOP shall be recorded clearly and be available for reference by any party subsequently working on the installation.

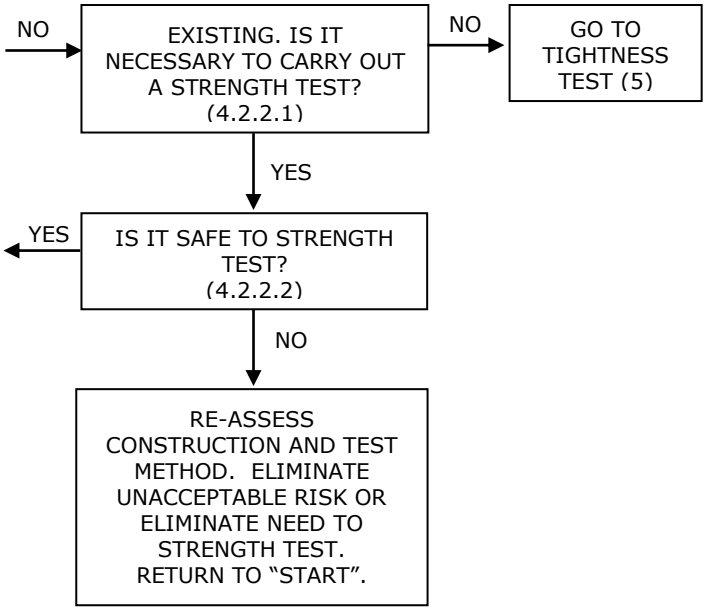
Clause 4.6.1 **Delete 2nd bullet. Substitute:**

- for PE, the lower of 350 mbar and STP.

Clause 4.6.13 **2nd paragraph. Delete entirely. Substitute:**

STP and MOP shall be recorded clearly and be available for reference by any party subsequently working on the installation.

Figure 4 **Delete top three right hand boxes. Substitute:**



Section 5 **Add new 6th paragraph:**

If necessary, for example when joints are broken, temporary continuity bonds shall be installed before testing.

Clause 5.1.2.6 **Delete entirely. Substitute:**

Where it is not necessary to test a component of the meter installation, such a component shall be isolated at the meter installation outlet valve/meter outlet valve (MIOV/MOV), as appropriate.

Clause 5.2.2(d) **2nd line of calculation. Delete entirely. Substitute:**

= $0.100 + (12 \times 0.0054) + (10 \times 0.00084) + (IV_{pa} + IV_{pb})\ (0.1)$

Clause 5.4.2 **5th bullet and Note. Delete entirely. Substitute:**

- ensure that, where necessary, any electronic gauge is certified for use in a hazardous area (see Sub-Section 3.4) and operated within the manufacturer's specification with regard to ambient temperature

Clause 5.5.2.7 **Retain title. Delete text entirely. Substitute:**

Where a pipework section passes through more than one of the Area types A, B or C/D shown in Table 8, the minimum value of MPLR shall apply for the whole section. If it can be proved that, for Area type A, there is no leak (see clause 5.5.2.2) the next lowest value of MPLR may be applied but the volume of pipework in the Area type A has to be included in the calculations unless it can be isolated.

Clause 5.7.4.1 (c) **1st sentence up to colon. Delete entirely. Substitute:**

Where TTD is less than the maximum for the gauge given in Table 6:

Clause 5.7.4.1(d) **1st sentence up to colon. Delete entirely. Substitute:**

Where TTD is greater than the maximum for the gauge given in Table 6:

Clause 5.7.4.2(d) **Delete text entirely, including Note. Substitute:**

Where TTD is less than the maximum for the gauge given in Table 6, the gauge shall be monitored as necessary for the duration of the test.

Clause 5.7.4.2(e) **Delete first sentence entirely.**

Clause 5.7.4.2(e) **Delete final sentence. Retain the note. Substitute:**

If LR exceeds MPLR, the test has failed and the leak(s) shall be traced, isolated and repaired, and the test repeated.

Clause 5.7.4.2(f) **1st sentence up to colon. Delete entirely. Substitute:**

Where TTD is greater than the maximum for the gauge given in Table 6:

Clause 5.7.4.2(f) **Delete final sentence. Substitute:**

If LR exceeds MPLR, the test has failed and the leak(s) shall be traced, isolated and repaired, and the test repeated.

Clause 5.8.2 **Delete text entirely. Substitute:**

After existing pipework has been returned to service, joints in any inadequately ventilated area (Area type A (see clause 5.5.2.2)) shall, if practicable, be checked with a suitable intrinsically safe gas detector, when the reading should not move from 0% LFL on the 0-10% LFL scale.

Clause 5.9.2 **Delete text and Note entirely. Substitute.**

A let by test shall be carried out on the appliance isolation valve (see clause 5.7.4.2(a). Thereafter, a tightness test shall be undertaken on the appliance connector. For pipework volumes not exceeding 0.12 m^3, there shall be no perceptible movement of the gauge over a period of 2 minutes at a pressure of not less than OP. For pipework volumes exceeding 0.12 m^3, the volume of the pipework shall be calculated and a tightness test carried out in accordance with clause 5.7.4.

Clause 5.9.3 **Final paragraph. Delete entirely. Retain Note. Substitute:**

In order to prevent lock-up, the regulator should be by-passed, using tubing of suitable material and bore, fitted across the regulator (or it may be possible to put the regulator out of action by screwing down to its maximum setting – in which case the isolation valve should be opened slowly to prevent regulator lock-up).

Clause 5.9.3 **Add a Note 2:**

Note 2: For a meter regulator, the adjustment of the regulator may only be undertaken by a GT – authorised person.

Clause 6.2.5 **2nd paragraph. 1st sentence. Delete entirely. Substitute:**

If it becomes immediately apparent that a direct purge will not achieve the required flow rate, the restriction may be removed and the purge re-started. Otherwise, an indirect purge using N_2 shall be carried out (see Appendix 8).

Sub-Section 6.7 **1st bullet. Delete entirely. Substitute:**

- comply with Sub-Section 3.4

Clause 6.9.1 **Page 42. 1st line. Delete first 6 lines entirely. Substitute:**

- PV of a diaphragm meter
  = 5 cyclic volume (Table 3)

  Note: The cyclic volume (capacity per revolution) is shown either on the index plate of modern meters or, on older tin case meters, on the badge plate.

- PV of a rotary, turbine or ultrasonic meter

Clause 6.11.2(d) **Delete text entirely. Retain Note. Substitute:**

Open all purge points and valves on connected vent stacks and admit air. Simultaneously, start the chosen method of "measuring" the flow of air (see clause 6.5.1) i.e.

- start a timer and
- read the in-line meter, or read the flow meter rate.

Clause 6.11.2(g) **Add a further sentence:**

Seal or disconnect pipework from the gas supply, sealing all ends with an appropriate fitting.

A2.3 **Delete 3rd bullet entirely. Substitute:**

- BS EN 12874 Flame arresters.

A4.2 **Example at bottom of page 60. Last line. Delete entirely. Substitute:**

= 0.00088 m^3 h^{-1} (st) air at OP.

A7.3.2 **Example on page 70. 2nd paragraph. Delete entirely. Substitute:**

Creep will be much less at 1.5 bar but, to be conservative, test with a GRM of 20 mbar.
TTD = 0.047 GRM x IV x F1 (Table 9)
TTD = 0.047 x 20 x 0.5 x 42 = 20 mins.
If a leak is indicated, repeat the test immediately to check whether it may be creep (unless the observed gauge movement is clearly too large to be due to creep).

Table 21 **Centre main column. Delete PE 100 SDR 11. Substitute:**

PE 80 SDR 11

A8.3 **2nd paragraph. Delete entirely. Substitute:**

Ensure a minimum volume of nitrogen equal to 1.5 times the installation volume of the pipework is available (see Table 24 and Sub-Section 5.2).

Table 24 **In column title, amend "QUALITY" to: QUANTITY**

A8 **Add at end of Appendix:**

A8.9 Once the purge to nitrogen is complete, it is advisable to then purge to air and ensure the oxygen level is at least 20%.

END OF UP/1 EDITION 2 AMENDMENTS